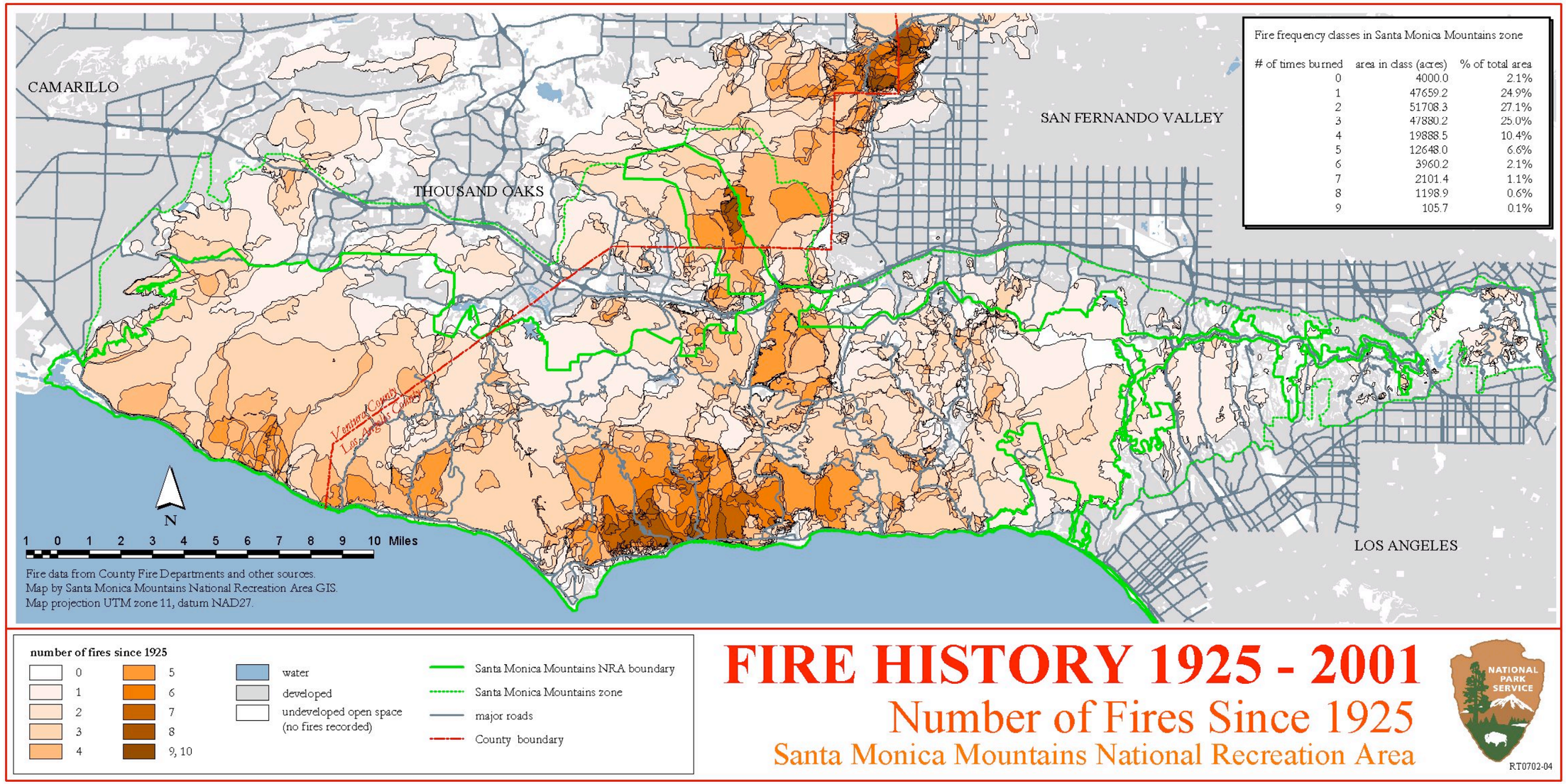
Figure 3-13 Fire History: Number of Fires



Fire Spread Patterns and Fire Frequency

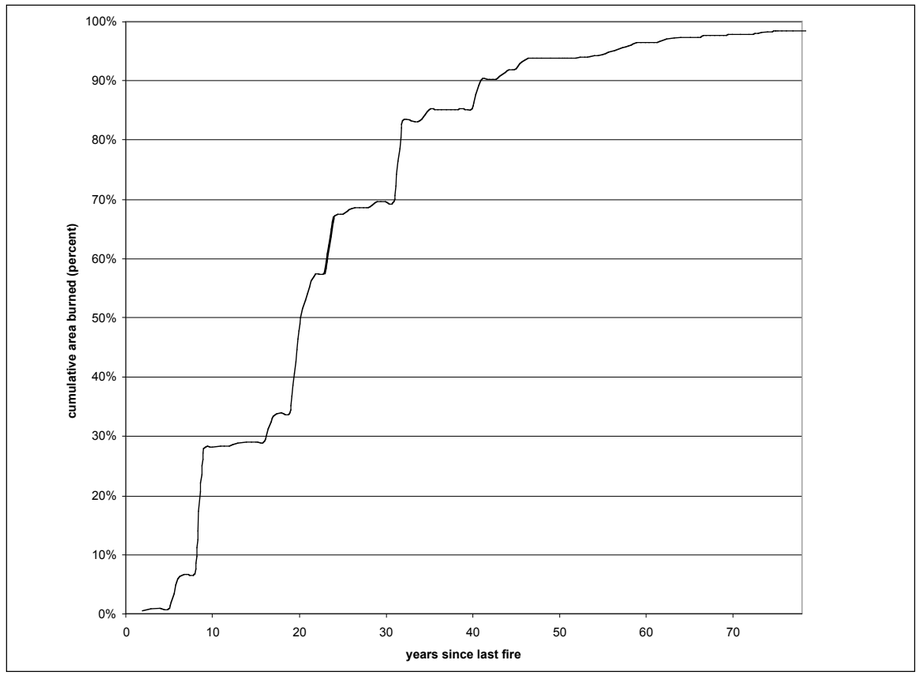
Individual fires in the Santa Monica Mountains are frequently triangular in shape. This pattern was pointed out by Radtke et al (1982) and is attributed to the fact that fires spread to the east and west as they approach the coast and are released from the confines of the steep north-south mountain canyons. The lateral spread of fires on the coastal slope may account for the increased fire frequency along the coast as different fires overlap in this area.

Similarly, the high fire frequency corridor through the Malibu Canyon area may also be partly a function of the break in the mountain range at Malibu Canyon and the increased wind speeds through this pass making spread from inland fire starts to the coast more likely.

Fire History

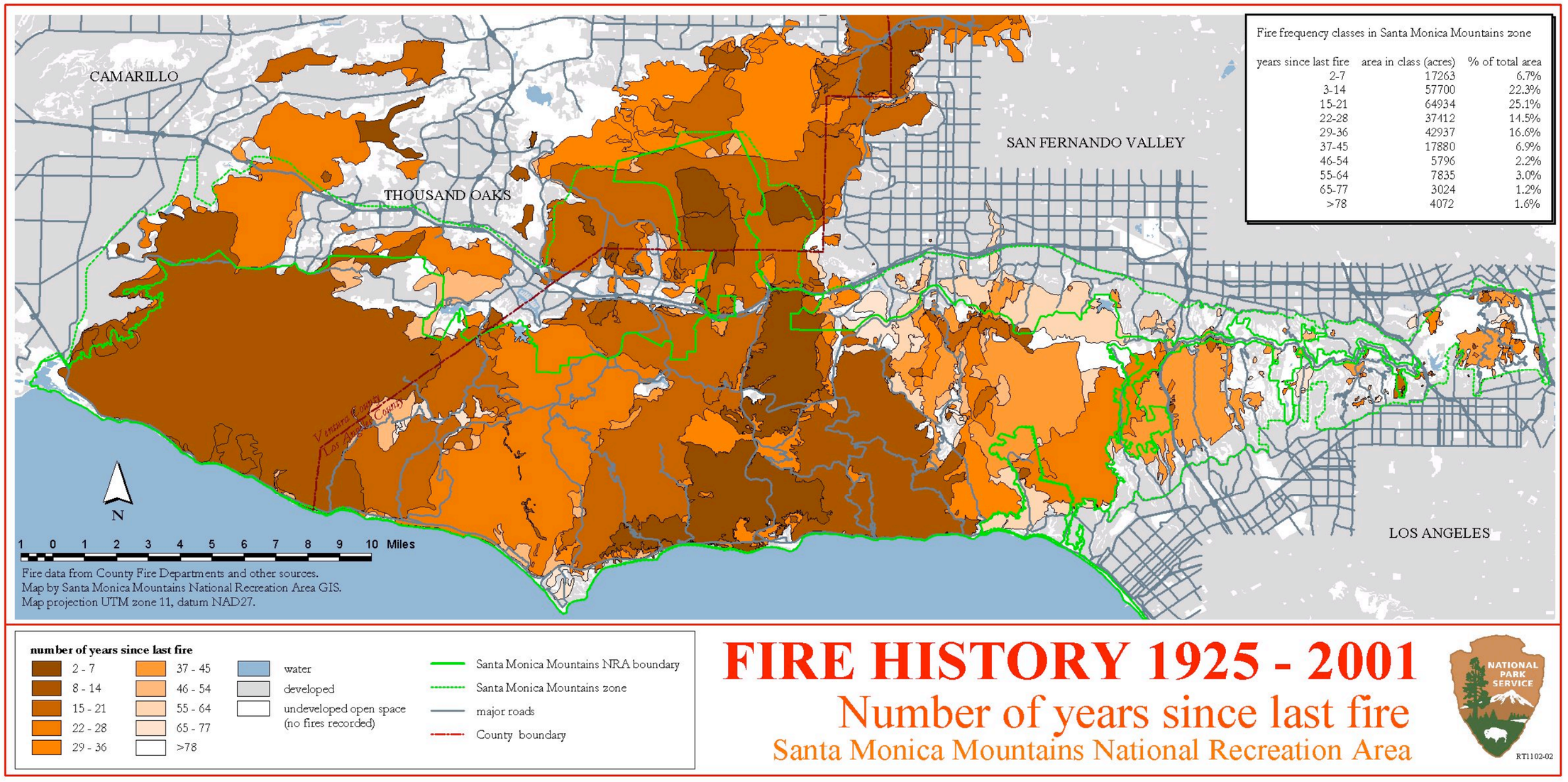
Figure 3-14 shows a cumulative area curve for age classes in natural areas of the Santa Monica Mountains. This shows that almost 30% of the vegetation is less than 10 years old due to the very large 1993 Green Meadow and Old Topanga fires. About 40% of the vegetation is in the 20-30 year old age class, and 25% in the 30+ age class. Only a very small fraction of the vegetation is older than 70 years.

Figure 3-14 Cumulative Total Area Burned by Age Class



The geographic location of the various age classes is shown on Figure 3-15.

Figure 3-15 Fire History: Time Since Fires



Vegetation Age Class Burned in Major Fires

In the largest wildfires, younger age classes of vegetation are not resistant to burning and fire size is not a function of the accumulation of fuels in older age classes of vegetation (Keeley and Fotheringham, 2001b; Figure 3-16).

Figure 3-16 Age Classes of Vegetation Burned in the Eight Largest Fires

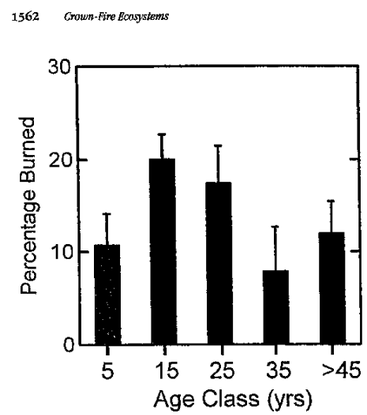


Figure 1. Vegetation age classes burned in the eight largest fires during the 30-year period of 1967-1996 in the shrub-dominated Santa Monica Mountains (Ventura and Los Angeles counties, California).
Data from Keeley and Fotheringham, 2001b

Environmental Correlates of Severe Fire Behavior

Above certain threshold values, the average area burned in chaparral wildfires does not linearly increase in relation to increased fuel age, increased average monthly temperature, or decreased monthly precipitation and decreased live fuel moisture. The regions of linearity and threshold values are shown in Table 3-7.

Table 3-7 Threshold Values Beyond Which Burn Area is Independent of Environmental Variables

Environmental Variable	Region of Linearity	Threshold
Fuel age (years)	1-28	28
Temperature (monthly average 0C)	12-21	21
Live fuel moisture (%)	90 - 200	<90 %
Precipitation (cm/month)	2-7	<2

These variables are also strongly interrelated. When average temperatures are low, burn area does not vary with fuel moisture; when average temperatures are high, burn area is affected by fuel moisture even at levels below 90%; when precipitation (fuel moisture) is low, variations in